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COMMITTEE ON THE PEACEFUL USES OF OUTER SPACE

VERBATIM RECORD OF THE 366th MEETING

Held at Headquarters, New York,
on Monday, 15 June 1992, at 3 p.m.

Chairman: Mr. HOHENFELLNER (Austria)

- Opening of the session
- Election of a Rapporteur
- Commemorative meeting on International Space Year (ISY)

  Panel: New approaches to international cooperation in space in a changing world

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The meeting was called to order at 3.15 p.m.

OPENING OF THE SESSION

The CHAIRMAN: I now declare open the thirty-fifth session of the Committee on the Peaceful Uses of Outer Space.

ADOPTION OF THE AGENDA (A/AC.105/L.193 and Corr.1 and Add.1)

The agenda was adopted.

ELECTION OF A RAPPORTEUR

The CHAIRMAN: The Chair has received from Minister Flavio Miragaia Perri of Brazil a letter informing the Committee that, owing to his new functions as Executive Secretary of the national working group for the United Nations Conference on Environment and Development, he will be unable to continue his responsibilities as Rapporteur of the Committee on the Peaceful Uses of Outer Space. I should like personally and on behalf of the Committee to thank Mr. Perri for his many years of dedicated service to this Committee.

The Brazilian Government, in keeping with a long-standing tradition, has nominated Mr. Edmundo Sussumu Fujita, Counsellor at the Permanent Mission of Brazil to the United Nations, to succeed Mr. Perri in the position of Rapporteur. I now put that nomination before the Committee. Of course, I am prepared to entertain any other nominations.

As there is none, I consider Mr. Fujita to have been elected unanimously as Rapporteur of the Committee on the Peaceful Uses of Outer Space. I should like, on behalf of the members of the Committee, to congratulate him and ask him to take his place on the podium.

Mr. Fujita took his place on the podium.

The CHAIRMAN: We have thus completed the organization of our work for the time being.

COMMEMORATIVE MEETING ON INTERNATIONAL SPACE YEAR (ISY)

The CHAIRMAN: I should now like to declare open the special meeting of the Committee on the Peaceful Uses of Outer Space commemorating International Space Year.

In Feburary of this year, it was my privilege to inaugurate the United Nations commemoration of International Space Year by opening the Scientific and Technical Subcommittee's special session devoted to International Space Year. I expressed at that time my great expectations for the Year and noted that, if the activities planned for that day were any indication of what we could expect for the rest of the Year, I had little doubt that the Year would be a resounding success.

Today, four months later, as we continue the activities of the Year, I have no doubt at all that International Space Year will be a success. With this thought in mind, I should like heartily to welcome and thank our guests, distinguished members of the international space community, whose participation in today's panel discussion on "New approaches to international cooperation in space in a changing world" will add greatly to bringing this Year to the successful conclusion I have predicted. I would also like to welcome all members of the Committee, observer delegations and non-governmental organizations who have joined the Committee on the Peaceful Uses of Outer Space in its special commemoration of International Space Year.

Some 35 years ago, when the space age was still in its infancy, the United Nations readily assumed the task of promoting international cooperation in the peaceful uses of outer space. In these past three and a half decades, its commitment to the goal of continuously strengthening and expanding such cooperation has never wavered. The General Assembly recognized immediately

(The Chairman)

that it would be necessary to create a global forum in which the use of space for peaceful purposes could be promoted, negotiated, monitored and coordinated, so that all humanity would benefit from its exploration and use. Thus, it established the Committee on the Peaceful Uses of Outer Space and its two subsidiary bodies - the Scientific and Technical and the Legal Subcommittees - and gave them the responsibility of ensuring the integrity of the use of outer space.

(The Chairman)

In 1989, as part of the ongoing effort to foster international cooperation in space, the General Assembly endorsed the international initiative to designate 1992 as International Space Year (ISY). It also endorsed the recommendations of the Outer Space Committee that international cooperation should be promoted throughout the Year, taking into particular account the needs of developing countries, and that the United Nations, through its Programme on Space Applications, should play a meaningful role in ISY activities.

The theme selected for International Space Year is "Mission to Planet Earth". This was no arbitrary decision: the Earth is our home. I can see no better use to be made of the rapid advances in space science and technology than for such impressive technology to be used for the protection of our home and our environment. However, to do this there must be universal acknowledgement of the importance of international cooperation in this sphere: the Earth's environment does not have national boundaries; there must be a readiness and a willingness to let all participate, to exchange information, particularly between the developed spacefaring nations and the developing countries; and there must be a concerted effort to improve the international community's awareness of, among other things, individual contributions to the safeguarding of our environment and the interrelationship between the Earth and the rest of the universe. This is why the main emphasis of United Nations activities for ISY will be on education, training and information, particularly for developing countries.

International Space Year provides us with an opportunity, through the many activities planned for the Year, to expand our thinking and reflect, in as wide a manner as possible, on the many ways in which we can improve and

(The Chairman)

expand international cooperation in outer space for the economic and social betterment of all. The panel discussion this afternoon, with four eminent panelists who have had long experience in space policy-making and international cooperation, should be very interesting and stimulating.

I have spoken repeatedly about my very positive feeling and about the potential of the Year to yield results which, it is to be hoped, will extend far beyond 1992. As the title of our panel discussion indicates, the world is changing: we are witnessing a dramatic global turn of events, politically, economically and socially, and we must be prepared to seize any opportunities that emerge from this global upheaval and act upon them with vigour. The cold war is over; the space age is now striding into adulthood and must therefore take its rightful place in the global effort to promote and maintain international peace and security. This can and must be done; the technology exists; all that is needed is the international political will to give serious and determined consideration to the study of how such technology may best be used to ensure that outer space is used for peaceful purposes to the benefit of all countries.

I firmly believe, therefore, that what we accomplish here in this Committee - our actions - can have a positive impact in all of those areas and on any of the factors I have mentioned. It has been a remarkable year, and recent developments have further convinced me of the importance of the work of our Committee and of its responsibility, as the focal point for international cooperation in the peaceful uses of outer space, to ensure that the benefits from space activities are shared by all nations and all people.

Several of our colleagues and guests are waiting to speak, so I shall limit my remarks. We also have a very interesting panel discussion ahead of

(The Chairman)

us. I hope that, in the course of this discussion, we may begin, as I have said earlier, on a concrete examination of the ways in which we may prepare ourselves for the changes of the 1990s. Let me once again welcome you all to the Committee's commemoration of International Space Year.

I should now like to welcome Under-Secretary-General Vladimir Petrovsky, who has been concerned for many years with space activities. I call upon him to address the Committee in his capacity as Under-Secretary-General for Political Affairs and as the person in charge of the Office for Outer Space Affairs.

Mr. PETROVSKY (Under-Secretary-General for Political Affairs): First of all, I should like to thank you, Mr. Chairman, for the kind words you addressed to me. I am really very pleased to be present at this special meeting of the Committee on the Peaceful Uses of Outer Space to commemorate International Space Year, and I extend the Secretary-General's best wishes for a successful and productive session.

This session of the Committee is taking place in a new and still rapidly changing international situation. This new situation offers new opportunities for peace, cooperation and development, but also poses major new challenges and new risks of conflict and instability. This Committee has an important role to play in enabling the United Nations to meet these new challenges.

The theme of International Space Year, "Mission to Planet Earth", stresses the importance of understanding the Earth as a single, complex and interdependent system and the unique role that space science and technology can play in promoting that understanding. The global perspective we obtain from space makes possible the consistent, long-term monitoring of the global

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environment that is essential for directing and evaluating the actions we take to protect the environment and in ensuring that our actions are effective.

The wide range of international and national organizations participating in the International Space Year, including the International Astronautical Federation, the Committee on Space Research, the Space Agency Forum for International Space Year and, of course, the United Nations, is impressive. The programmes that are being organized and undertaken by these organizations and their members, both for the systematic and coordinated collection of space observations and for the analysis and interpretation of the data for the benefit of all countries, will have a lasting, beneficial effect for all humankind. This broad international cooperation is essential if the problems of understanding, monitoring and protecting the environment are to be addressed effectively.

The activities being undertaken by the United Nations as part of International Space Year are focusing on education, including both specialized training and public information, in order to increase awareness of the benefits of space activities and to improve access to those benefits by all countries. In addition to the ongoing education and training activities of the United Nations space applications programme, an international effort is now under way to establish regional centres for space science and technology education in developing countries. The success of this effort will depend on the support of many countries, both developed and developing.

The importance of environmental issues and the difficulty in achieving effective international cooperation in this area have been illustrated by the recently completed United Nations Conference on Environment and Development,

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held in Rio de Janeiro. While that Conference focused on the politics and economics of environment and sustainable development and was not able to examine in detail the science and technology needed, it is nevertheless clear that much scientific and technological development will be required to implement national and international environmental policies as they are developed.

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The Framework Conventions on climate change and on biological diversity, which were opened for signature in Rio, and the efforts towards sustainable development to be undertaken under Agenda 21 will require more extensive use of space technology through international cooperation involving all countries.

This Committee has provided the United Nations with useful guidance in developing the role of space technology for environmental monitoring and economic development. The Office for Outer Space Affairs, formerly the Outer Space Affairs Division, and its Space Applications Programme, working under the direction of this Committee, have been promoting the use of space technology for these purposes by all countries, and particularly by the developing countries, since the Committee was established by the General Assembly in 1959.

As indicated by the Rio Conference, it is essential to recognize that environmental protection must be complementary to economic and social development. The broad views of the Earth provided by remote-sensing satellites provide vital information that is needed to develop natural resources on a sound and sustainable basis. The broad international dissemination of data from remote-sensing satellites has already been used for developing agricultural, forestry, water and mineral resources in many countries, but much work still needs to be done to ensure that all countries can effectively use space technology for sustainable development.

The work of the United Nations should promote not simply the development of space technology but, more importantly, the applications and spin-off benefits of space activities for improving the everyday lives of people in all countries. While the United Nations is particularly concerned with assisting developing countries, we must recognize that all countries, whatever their

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level of development, need to use space technology for economic and social development and that all countries benefit from international cooperation in this field. It is important to recognize that a number of developing countries, such as India and Brazil, have substantial space capabilities which can be used for the benefit of developed countries with limited space capabilities of their own.

This year marks not only International Space Year but also a turning-point in international relations and in the role of the United Nations. As we move from an era of cold war and global confrontation towards a new era of greater international cooperation, there is increasing hope and expectation around the world that peace and security will be greater in all its aspects: environmental, economic, social, political and military. If the United Nations is to respond effectively to these changing expectations, it must improve and expand its capabilities and its efficiency. There is an urgent need for new and creative thinking with regard to both international relations and the role of the United Nations.

The shift away from cold-war confrontation and the decline in tension between the two major space Powers offer new opportunities to develop greater cooperation among the space Powers and between the space Powers and other countries that are primary users of space technology. Space programmes that have focused much of their economic and human resources on military and political competition can now provide leadership in demonstrating the uses of advanced technology for broad international cooperation.

In the present changing international situation, the United Nations is being asked to take on new and expanded responsibilities for peace-keeping, peacemaking and preventive diplomacy. The new responsibilities include such

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functions as election supervision, crisis monitoring, refugee resettlement, cease-fire monitoring and redevelopment programmes in areas affected by destructive conflicts. The use for these purposes of space technologies such as satellite communications and remote sensing can improve the capability of our Organization effectively to promote peace, security and development within its limited resources.

The end of the cold war has led to a number of important new arms-limitation and disarmament agreements. As the scope of these agreements and the number of countries involved have grown, so has the need for monitoring and verification as well as for other confidence-building measures. Advanced space technologies offer a variety of techniques for monitoring and promoting compliance with arms-limitation agreements. Consideration needs to be given to ensuring that all countries benefit from the use of these technologies for such important peaceful purposes. As disarmament proceeds, a large number of weapons and military facilities will need to be disposed of or converted to civilian use. The conversion of military space technology to civilian applications could serve as a model for the conversion of other military capabilities, and space technology might help to manage the dismantling and conversion of ground systems to more productive economic and social functions.

In the new international political context, new approaches to international cooperation in space will be needed to meet the new opportunities and challenges. The United Nations and the international community will be looking to the Committee on the Peaceful Uses of Outer Space for direction and guidance in this area. I am sure that the eminent speakers in today's panel discussion, all of whom have had long experience in

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space-policy making and international cooperation, will be offering us some interesting ideas for our further consideration. I hope that delegations will be able to use these new ideas to come up with proposals for making international space cooperation and the work of the Committee more effective.

As the Committee resumes its work in the new international environment, it is important to recall that space science and technology have provided many impressive examples of international cooperation. The Committee on the Peaceful Uses of Outer Space, since its creation, has been an important force in promoting the cooperative use of space for security and development. The new era in international relations offers new challenges to the international space community and to this Committee in particular to continue to provide leadership in international cooperation in the new era. It is esesential that this cooperation involve the active participation not only of the countries with advanced space capabilities but of all countries. It is also essential that the United Nations, together with its specialized agencies, work closely with other international and national organizations towards that goal.

The strong tradition of this Committee in forging consensus and establishing cooperation from sometimes divergent national interests provides a solid basis for future progress in international cooperation in space. The discussions and debates that take place here are an essential element in strengthening exising cooperative mechanisms and developing new ones.

It is an honour to participate in this special meeting. Of course, the Secretariat will, as usual, provide its full support to the work of the Committee. I shall follow the proceedings of this session with great interest.

The CHAIRMAN: I thank the Under-Secretary-General, Mr. Vladimir Petrovsky, for his thoughtful statement and his ideas on the role of the United Nations in the changing world.

I now welcome and call upon Dr. Alvaro Azcarraga, President of the International Astronautical Federation (IAF).

Mr. AZCARRAGA: It is a great honour for the International Astronautical Federation to be represented here today. I remind the Committee that the Federation is a non-governmental organization with 123 members in 39 countries. Its aim is to foster the development of astronautics and astronautical research all around the world, for the service of mankind.

A few years ago, as soon as the concept of the International Space Year (ISY) was approved, IAF created an ad hoc committee to plan and coordinate activities. The committee's aims were: to prepare proposals to other technical and administrative committees of IAF concerning ISY; to prepare decisions and recommendations to be made by the Bureau and the General Assembly of the Federation concerning ISY activities of IAF and its members; to coordinate the ISY activities of IAF with the International Astronautical Academy and the International Institute of Space Law; to organize collaboration and coordination with the Committee on Space Research (COSPAR) and other relevant international organizations in preparing ISY activities; to coordinate ISY space projects in areas of IAF cognizance; and to prepare and execute IAF projects in support of ISY.

The Federation has been very active in those preparations for several years, and has participated in all International Space Year planning meetings, such as that in Kyoto in May 1990, that in Brussels in December 1990, that in

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Moscow in May 1991 and that in Munich in March and April 1992, and it will participate at the World Space Congress in August this year in Washington, D.C.

The Federation's Education Committee is working on what is described as a world-wide launching campaign for student payloads, with one event in Mourmelon, France, from 22 to 29 July 1992 and another in Orlando, Florida, from 6 to 11 September 1992. In addition to the sessions held during this Committee's Scientific and Technical Subcommittee meetings in February this year, IAF is organizing with the United Nations a workshop devoted to International Space Year, through its Committee on Liaison with International Organizations and Developing Nations (CLIODN), to be held from 27 August to 30 August this year in Washington, D.C., just before the World Space Congress. The Congress, which is being organized and co-hosted by IAF and COSPAR, under the auspices of the American Institute of Aeronautics and Astronautics, will take place from 28 August to 5 September.

The World Space Congress is probably for the Federation the crowning event in the International Space Year. Several symposia will deal with ISY. For example, the Symposium on Space Systems will devote one session to Earth-oriented systems and technologies; the Symposium on Space Education will devote two sessions to educational activities for the international space year and general space education; and the International Institute of Space Law will dedicate one session to emerging and future supplements to space law specifically in the context of the International Space Year.

I am proud to say that the World Space Congress will be the greatest space congress in history, both by the sheer number of participants and the quality and quantity of symposia, special events and ordinary sessions held during the Congress. The themes of the Congress are discovery, exploration

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and cooperation, as they were described by the Chairman of this Committee today, and they are all most appropriate for a meeting taking place in the capital of the United States of America, a leading country in space faring, and so actively engaged in discovery, exploration and cooperation in every field of human endeavour.

I sincerely hope that all those present today will be able to attend, as we need all the wisdom and courage available to foster space research and exploration, because they contribute to the cause of peace, help us better to understand and use our delicate ecosystem and, last but not least, give vital support to the promotion of developing countries.

The CHAIRMAN: I now welcome and call upon Professor Ian Axford, President of the Committee on Space Research (COSPAR).

Mr. AXFORD (Committee on Space Research (COSPAR)): I am pleased to have the honour of addressing this distinguished audience. It is my pleasure also to extend my sincere wishes for a fruitful chairmanship to Ambassador Hohenfellner, who has agreed to carry on the important role Ambassador Jankowitsch played for almost 20 years. These responsibilities take on enhanced importance as the world turns increasingly towards the United Nations. The Committee on the Peaceful Uses of Outer Space will have a critical part to play in the future: to coordinate international space activities; to promote the utilization by all countries of the benefits offered by space technology; and to encourage responsible management of the Earth's resources, with the goal of safeguarding our common natural heritage.

COSPAR is proud to have collaborated with the Committee on the Peaceful Uses of Outer Space since its very inception. Our yearly progress reports enable us to disseminate internationally information regarding the latest

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developments in the space sciences. Our cooperation has also offered opportunities to bring topics of immediate and vital importance to the United Nations audience. A recent example of this was the jointly organized COSPAR-International Astronautical Federation (IAF) symposium, "Space Technology and the Earth Environment", held during this Committee's Scientific and Technical Subcommittee session last February.

This year marks the thirty-fifth anniversary of the beginning of the space age, in addition to the five hundredth anniversary of Columbus's voyage, and has been designated the International Space Year (ISY). The most important ISY 92 event to be co-organized by COSPAR is the World Space Congress, which takes place from 26 August to 5 September. The Congress will begin with a joint United Nations/IAF/COSPAR/AIAA symposium on "Space Technology in Developing Countries". The COSPAR scientific programme is composed of about 75 symposia and meetings, and will include over 2,100 papers. The scope of this programme far exceeds that of any previous COSPAR meeting.

COSPAR values the cooperation established with IAF. We are particularly appreciative that the collaboration between our two organizations will bring about an unprecedented gathering of scientists, researchers, engineers, lawyers and many other professionals involved in the exploration and uses of outer space.

In addition, the Space Agency Forum on International Space Year (SAFISY) has entrusted our committee with the leadership of the Panel of Experts on Space Science. This Panel has put together a number of projects, 27 of which have been approved by SAFISY. A number of these will be under way and reported on at the World Space Congress.

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Examples of such projects concerned with the problems of the environment include the project on global land cover change, led by Australia, and that on greenhouse effect detection, lead by the United States, both involving many other countries. They will be reported on at the World Space Congress.

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The world's space agencies, through the Space Agency Forum for the International Space Year (SAFISY), have started a number of cooperative projects, 21 in space science, 13 in Earth sciences and 5 in education, to be carried out over the next decade.

The Committee on Space Research (COSPAR) will also be organizing two colloquia to be held just prior to the World Space Congress. The first, on comets, will be held at Ann Arbor, Michigan, from 24 to 27 August, and the second, "Initial Results from the Solar-Terrestrial Energy Program," will be held at Laurel, Maryland, on the same dates.

Mr. Chairman, ladies and gentlemen, I wish you all the most fruitful of deliberations.

The CHAIRMAN: I thank Mr. Axford for his kind words addressed to me. I should like to take this opportunity to express particular thanks to Dr. Azcarraga and Professor Axford. Their organizations, the International Astronautical Federation and the Committee on Space Research, have over the years been very supportive of the work of the Committee on the Peaceful Uses of Outer Space, and for that, we are very grateful. On behalf of the Committee, I should like to convey best wishes for a successful Congress. We look forward to receiving the results of its proceedings.

PANEL: NEW APPROACHES TO INTERNATIONAL COOPERATION IN SPACE IN A CHANGING WORLD

The CHAIRMAN: We turn now to the next item on our agenda. Our eminent panelists are: Dr. Richard Barnes, former Head of International Affairs, National Aeronautics and Space Administration (NASA); Dr. Roy Gibson, former Director-General of the European Space Agency; Professor Rao, Head of the Indian Space Research Organization; and Academician Roald Sagdeev, former Director of the Institute for Space Research of the USSR.

At the invitation of the Chairman, the panelists took the places reserved for them on the podium.

The CHAIRMAN: It is a great pleasure and privilege for us to greet such distinguished members of the international space community. Your participation in this panel discussion commemorating International Space Year is invaluable, and I can assure you that we are all looking forward with anticipation to your presentations.

Since detailed biographical notes on the panelists have already been circulated, and since I suspect that they are quite eager to begin the discussion, I shall not attempt to restate the biographies of the speakers. Therefore, without further introduction, I should like to call upon the first speaker.

Mr. BARNES: Seven years ago, in the summer of 1985, the late United States Senator Spark Matsunaga proposed an International Space Year. He noted the convergence in 1992 of two commemorative events whose themes had special significance for the space age - the five-hundredth anniversary of Columbus's voyage to the New World, with its themes of exploration and discovery, and the thirty-fifth anniversary of the International Geophysical Year, with its themes of scientific inquiry and international cooperation. Senator Matsunaga envisioned an International Space Year (ISY) of globally coordinated space-related activities in 1992. It would constitute the first year-long, world-wide celebration of humanity's future in a new age of global cooperation and discovery, the Space Age.

The original version of Senator Matsunaga's resolution, which was jointly sponsored by Senator Jake Garn, cited three anniversaries: Columbus's five hundredth, the International Geophysical Year's thirty-fifth and the

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seventy-fifth anniversary of the Russian Revolution. This third conjunction immediately attracted controversy in the United States, so the Senate Foreign Relations Committee deleted mention of it from the legislation. The final resolution was then passed, along with instructions that

> "the Administrator of the National Aeronatics and Space Administration (NASA) ... should initiate discussions that explore the opportunities for an ISY in 1992".

Before looking in detail at how Senator Matsunaga's resolution was implemented and at the birth of the Space Agency Forum for ISY (SAFISY), I would like to address a much broader question: Is it time to create a world space agency? In doing so, I shall, with his kind permission, borrow extensively from my good friend and former NASA boss, Kenneth Pedersen, who is now a teacher and scholar at Georgetown University in Washington. Two months ago, Pedersen, who in the early 1980s frequently represented the United States at meetings of this Committee and its Subcommittees, presented an excellent paper on this very subject at the thirtieth Goddard Memorial Symposium.

I remember back in the 1960s - in the same time period that this Committee on the Peaceful Uses of Outer Space was created - there was considerable talk about creating a more ambitious space agency within the United Nations framework, modeled on the International Atomic Energy Agency (IAEA). I was only sporadically involved in those discussions, so I can only guess at the reasons the proposal was not adopted, foremost among which were the increasing cold-war tensions between the space super-Powers following the construction of the Berlin Wall and the Cuban missile crisis. Partly because of those tensions, there appeared a growing disenchantment with the United

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Nations as a forum in which tough international problems could be tackled and resolved. Finally - and this is pure guesswork on my part - once negotiation of the outer-space Treaty of 1967 was completed there was no requirement for such a governing body perceived in the international community. Let me say here that I consider successful negotiation of the 1967 Treaty on outer space as a historical accomplishment of this Committee and perhaps Senator Matsunaga should have recognized its twenty-fifth anniversary this year in his ISY resolution.

Jumping now to the 1990s, Pedersen notes that recent events and trends have created conditions more favourable to consideration of a world space agency. First, of course, is the end of the cold war. In parallel, there has been a significant change in both official and unofficial United States attitudes towards the United Nations family of institutions. United States support for the crucial role of the Security Council in focusing international resistance to Saddam Hussein's aggression against Kuwait two years ago and for the subsequent central role of IAEA in monitoring the dismantling of Iraq's clandestine nuclear programme are highly visible evidence of this turn-around.

Pedersen categorizes the arguments for a world space agency as follows. The first is political. Space, like nuclear power, is now too important on the world agenda to be left to the uncoordinated actions of Governments. The second is economic. A single agency can provide a louder voice in the advocacy of space benefits and can enhance overall efficiency by making available resources stretch further. The third is managerial. It can provide a mechanism for prioritizing the space objectives of its members and help develop them into common agendas. The next is regulatory. It could take the

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lead in developing standards and rules of the road to make space a safer and more orderly place to operate. And, lastly, there is the informational argument. It can serve as a clearing-house for disseminating information on its members' activities, as well as organize conferences and conduct studies to facilitate the exchange of ideas and knowledge among its members.

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Having made the case for a Space Agency, Pedersen goes on to address the factors which lead him - and me - to conclude that the time is not yet ripe for such a bold step. First is the absence of "vital national interests at risk in civil space today, to which the obvious and urgent response is a transfer of authority and resources to a higher, supernational level".

A second inhibiting factor is the number of existing international agencies and mechanisms: for example, the World Meteorological Organization (WMO) and the International Telecommunication Union (ITU), which already deal with a number of the items that might be on the agenda of a World Space Agency.

Finally - and in my view this is one of his most telling points and one which I am sure is appreciated more by this audience than outside the halls of the United Nations - Pedersen observes that

> "By and large, permanent international organizations do those things well that [their member] nations want to have done. But international organizations can rarely rise above flagging national will, at least on the part of their key members, nor do they necessarily do things more wisely or efficiently. Indeed, the creation of international organizations or institutions can provide national governments with the means for evading rather than stepping up to their responsibilities."

When NASA was asked to take the lead in implementing, in the United States, Senator Matsunaga's resolution, I remember thinking, "What in the world are we going to do with this ISY idea?" It certainly did not fit naturally into NASA's normal approach to international cooperation. First, it was, from NASA's viewpoint, not invented here. Normally, United States international space cooperation initiatives originate in the Executive Branch, with the Congress providing its blessing through the annual authorization and budget appropriation processes.

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Second, ISY was not - at least initially - programmatic in its focus. It did not fit within a traditional scientific discipline, and you could not design and build it like a spacecraft or a ground station.

After scratching our heads, we at NASA took two steps which those of you who serve in governmental bureaucracies will immediately recognize: first, we convened a committee; then, we solicited the reaction of our partner space agencies around the world. Both steps turned out to be quite productive. The United States interagency ISY Committee, which includes representation from 14 government agencies and 9 private-sector associations with space-related interests, became both a forum for brainstorming ideas and a channel for disseminating information on ISY-related plans and activities.

The initial reaction from space agencies in 19 nations and 4 international organizations, while predictably cautious, was surprisingly forthcoming - especially when you consider that space agencies usually like to know the price tag attached to new ideas before they endorse them.

Momentum behind ISY accelerated in 1987 with the establishment of the United States International Space Year (USISY) Association, whose president, Harvey Meyerson, is known to many of you here and who had from the beginning been a close collaborator of Senator Matsunaga's. This Association has played a number of important roles in publicizing and promoting ISY in the United States, and its success stimulated the establishment of counterpart non-governmental organizations in Europe and Japan.

Not the least of USISY's important functions has been to nudge the government bureaucracy forward when inertia threatened to slow progress towards defining specific actions and projects necessary to convert ISY from a concept into a reality. In particular, USISY organized two early conferences

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that were essential in catalysing this process: one in Hawaii, Senator Matsunaga's home state, in August 1987, and then in April 1988, the ISY "Mission to Planet Earth" Conference in Durham, New Hampshire, at which SAFISY was born.

By early 1988, after two years of dialogue with the international scientific community, NASA had identified "Mission to Planet Earth" as a principal theme for its ISY efforts. At the Durham Conference, NASA reported its decision to a meeting of senior officials from 18 international space agencies. Without any prompting, the other agency representatives unanimously adopted "Mission to Planet Earth" as a major ISY theme. I wish NASA could take credit for having arranged this unanimous endorsement, but I suspect that if we had tried to orchestrate it in advance, it would not have happened.

That meeting of senior space officials in Durham became, in retrospect, the first meeting of SAFISY. For this, NASA can take some credit - or blame - for advance orchestration, although it hardly seemed to be a major institution-building exercise at the time. It had become apparent to us and to other space agencies with which we consulted that the creation of some kind of mechanism for international coordination of ISY planning and activities would be useful. Some organizing efforts had already gone forward in the framework of the International Council of Scientific Unions (ICSU) to establish mechanisms that paralleled those set up in the 1950s to coordinate International Geophysical Year (IGY) research.

However, between the 1950s and the 1980s, Governments had established national and regional space agencies, which in turn established their own networks of cooperation around the world. It was therefore logical that space agencies should be the focus of ISY international coordination. Some

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suggested a formal coordinating committee or council, but space agencies do not like to be coordinated. Would we have to get formal blessings from our foreign ministries each time we met? The name "council" sounded too formal, so we finally settled on "forum" as a suitably low-key, unthreatening designation. NASA brought to the meeting in Durham a single-page straw-man terms of reference, expecting it to be debated, amended and perhaps even rejected. To our surprise, it was adopted with little change after only a brief discussion, and I think Roald Sagdeev will remember that. Thus was SAFISY born.

Perhaps one of the most important ingredients in the ultimate success of SAFISY was the consensus choice of the widely respected Professor Hubert Curien of France as Chairman. Professor Curien had been well known to the international space community for more than a decade, having served two terms as Chairman of the Centre National d'Etudes Spatiales (CNES), the French Space Agency. He had also helped steer the European Space Agency (ESA) through some difficult times as Chairman of its governing council. In addition, he was the Chairman of the ISY Committee of COSPAR, the Committee on Space Research.

When he was invited to preside over the Durham Conference, Curien had just completed a term as Minister for Research and Technology in the French Cabinet and had resumed his teaching duties at the Crystallography Laboratory of the University of Paris. Not long after the Durham Conference, Professor Curien was tapped to rejoin the French Cabinet, so we started worrying about finding a suitable successor as SAFISY Chairman. But much to the surprise and pleasure of all the SAFISY participants, he had apparently been infected by the ISY virus and decided to continue with SAFISY in spite of

(Mr. Barnes)

his much-increased official workload. I believe the entire ISY enterprise has been the beneficiary of his continued involvement.

In the four years since its creation, SAFISY has proved to be an effective mechanism for the international coordination and promotion of ISY activities. Further, its regular annual meetings have provided an opportunity for senior space agency officials from around the world to discuss common problems and interests in a relatively informal and unstructured environment.

(Mr. Barnes)

SAFISY is, as Professor Curien often says, a "light" organization. There are few overhead costs and no permanent staff. The agency which hosts a SAFISY meeting provides secretariat services until the next annual meeting. SAFISY has operated through three Panels of Experts - Earth Science and Technology, Education and Applications, and Space Science - which have developed a varied menu of projects in which one or more space agencies has volunteered to take the lead and others have joined in as their interests dictate. This lead agency concept keeps overhead costs low and assures that projects are integrated into ongoing space agency programmes, thus assuring real-world relevance. A special effort has also been made to reach out to developing nations to make it possible for their experts to attend various ISY conferences and panel meetings.

I have dwelled at some length on SAFISY because I believe it serves as a useful organizational model for international coordination. It is by no means the only such body in the space arena to evolve from voluntary coordination efforts by space agencies. Others are the Coordination Group for Geostationary Meteoroligical Satellites (CGMS) and the Inter-Agency Consultative Group (IACG), which coordinated Halley Comet missions in the 1980s. All three bodies - SAFISY, CGMS and IACG - share certain characteristics. They evolved from the bottom up and were not imposed from the top down. They have very light administrative structures, brief charters and - most important, in my view - they respond to the needs of the space agencies which created them.

In my view, a realistic assessment of the prospects for a world space agency must start from the premise that international competition, which has been present in the space arena since the launch of Sputnik in 1957, will

(Mr. Barnes)

continue to coexist with cooperation for the foreseeable future. The dissolution of the Soviet Union and the maturing of space capabilities outside of the former cold war adversaries have given greater visibility to the economic and commercial dimensions of this competitive environment. It has also, from my perspective, not simplified the relationships between civil space enterprises and international security considerations. The threat of a nuclear missile exchange between the super-Powers may have been reduced dramatically, but as the events in the Persian Gulf last year and in Bosnia today demonstrate, the world we live in is still a dangerous place. Brought down to the operational level, this means that bilateral and international export control mechanisms such as the Coordinating Committee on Export Controls (COCOM) and the Missile Technology Control Regime (MTCR) are unlikely to disappear any time soon.

Now, that would be a real challange for a world space agency - to develop and oversee "rules of the road" for the international trade in the space technologies which have both civil and military applications. Is anyone here ready to take that one on?

Mr. GIBSON: I have got to confess that when I first heard the idea of making 1992 the International Space Year, I was not an instant convert. I thought that, if space was so good, why does it need this publicity, a bit like Mother's Day? Anyway, for me the link between Christopher Columbus and space activities in the late 1980s did not seem to me to be very obvious, apart from space exploration, and that did not seem to be really on the top of anybody's agenda at the time. Frankly, I still do not feel very comfortable about artificially pushing space as such.

(Mr. Gibson)

But I am bound to admit that, since the consecration of the International Space Year (ISY), two justifications have come along quite unexpectedly, and I believe that these put it into an altogether different light. The first was the realization by politicians in many parts of the world that the warning cries that they had been hearing from the environment protection groups really needed to be taken more seriously. They realized that supporting environmental protection measures - provided it was judiciously done - need not lose them any votes, whereas total inactivity in the environment sphere would undoubtedly lose them votes. Now, the obvious uses of space techniques in the battle to halt, and if possible to reverse, the destruction of the environment gave ISY, in my view, a political relevance that it would not otherwise easily have gained.

The second post-hoc justification was provided by the complex series of political events centred around the lifting of the Iron Curtain, and in particular the reunification of Germany. The priority given to this subject, and indeed to many of the other actions connected with welcoming back the Eastern and Central European States into the family of Europe, are putting a tremendous financial strain on Germany in particular and to a lesser extent on a number of other Western European treasuries.

Germany has for many years provided at least 25 per cent of the funding of the European Space Agency (ESA), and it has been a willing partner in financing the cooperative programmes with the National Aeronautics and Space Administration of the United States (NASA) as well as those programmes devised and proposed to Europe by France, which is Europe's most imaginative space nation. Unfortunately, just at a time when German purse strings were being tightened, the ESA ministers were being called upon to underwrite a new and very ambitious long-term programme.

(Mr. Gibson)

It came as a great shock when Germany was unable to maintain its ESA subscriptions at the same high level as in the past. We might note in passing that this is not likely to be a permanent state of affairs, but I suppose it would be prudent for us to work on the assumption that there is not likely to be a great increase in German space contributions in the next four or so years. This comes at a time, we must remember, when the European Space Agency is still looking for endorsement for its future programme.

Well, it is always in times of financial difficulty like this that the knight in shining armour carrying the flag of international cooperation comes onto the stage. This was no exception. The ESA ministers at their Conference at the end of 1991 specifically urged the ESA Director-General to increase and widen international cooperation, which implicitly means to look beyond the traditional cooperation with the United States.

The appearance of the white knight with his flag was all the more obvious on this occasion because, behind the Iron Curtain that had been lowered, there proved to be a space capability even greater than had been supposed. What was more natural than to envisage a cooperation that might go some way to ensuring that ESA's new programmes - temporarily on hold because of insufficient funding - might be successfully completed through cooperation with this new, powerful source, which hitherto had been a rather uncertain and sometimes enigmatic partner?

Thus by the dawn of 1992, the scene was set in Western Europe for a much more favourable official perception of international cooperation in space, particularly, I would judge, either in aid of the fight for the environment - and in such a knowledgeable forum I do not need to go into the details of how space technologies can be used in the environment battle - or to harness

(Mr. Gibson)

technologies which were being developed in Eastern and Central Europe and which would otherwise have to be redeveloped in Western Europe. I suppose that, to get everybody's support, it will preferably be both environmental and technological.

Now this may sound - and I apologize for it - like a rather clinical, not to say cynical, analysis of the present position. But I believe it to be accurate. Moreover, it is a perfectly acceptable basis on which to construct a realistic international cooperation in space. It is a good deal more durable and reliable than many previous one-off flashes of cooperation that, in my view, have failed to ignite any permanent cooperative spirit.

(Mr. Gibson)

It provides, in my view, a particularly promising basis for a form of international cooperation which has never previously got off the ground, if that is not a bad pun: I am referring to a meaningful cooperation with developing countries. I know that we can all cite examples of programmes with developing countries using space, but it is really difficult to convince oneself that space has helped reduce the gap between the developed and the developing anything more than marginally.

I hope, therefore, that the International Space Year is going to build on this quite fortuitously provided basis, and, as it does so, I would encourage a very down-to-earth approach to international cooperation. I suppose that everybody has his own list of the basic conditions for successful space cooperation, but, since you were kind enough to invite me today, I am afraid I am going to inflict my list on you.

It starts by saying that all who take part in a cooperative programme must be more or less equally enthusiastic about it from the beginning. In the European Space Agency, we used to call this the "law of equally distributed dissatisfaction", but you can, of course, view it more positively if you like: it means that all participants need to be able to see what they are going to get out of the programme and, equally, they need to know approximately how much it is going to cost them over the life of the programme.

My second little rule is that participants should, to the extent that it is possible, join the cooperation in time to have a say in the definition of the programme. They should not be invited, once the definition is complete, to take it or leave it.

The next point on my wish list is that the day-to-day management of the programme that is decided should be left to a responsible programme manager

(Mr. Gibson)

and his team, giving, of course, sufficient visibility to the contributors of the money to enable them to judge that their terms of reference are being respected; it is, though, quite impossible to run a successful political space programme.

Even so, each participant in this kind of cooperative programme has got to realize, in advance, that a cooperative programme is harder, more wearing on the nerves and generally more time-consuming than one in which you call all the shots yourself, and one needs to realize that at the beginning.

If cooperation is going to be with developing countries - and if I may make a personal remark, I do hope that this is the direction that is going to take off - then, with developing countries, the programmes have got to make the maximum use of what already exists in those countries, and they should leave the developing country better off, in a better general position, after the programme than it was before the programme. The programmes have got to be designed for the needs of the developing country and not for the ego of the developed country.

Finally, international cooperation does not need to be exclusively at government-to-government level. Initial government blessing is often helpful - indeed, sometimes, it is absolutely essential - but we should try to get the private sector involved as soon as possible: they do these things much better than most of us in government do.

If ISY can convince our political masters of the value of what we might call "controlled international cooperation using space techniques", and if it can help to establish the conditions necessary for making such cooperation a success rather than simply a show, then the Year will have been well worth while. It is not - and I think it was our Under-Secretary-General who mentioned this - the sort of subject that can be definitively dealt with in a

(Mr. Gibson)

single year and thereafter put on the shelf and forgotten; the success of the Year will depend crucially on developing mechanisms for continuing and extending cooperation over the decades to come.

As Dick Barnes just said, it has become fashionable to flirt once again with the idea of a world space agency, but I strongly doubt if this is the way to go. The need is to ensure that cooperative projects really happen on the ground, and the most that is needed, in my opinion, is a sort of marriage bureau bringing appropriately matched partners together - and perhaps this Committee has a role to play here; perhaps it can take over part of the torch of ISY.

It sounds so simple to be recommending that we cooperate - really no more than the application of pure common sense - but in fact there are probably more people outside this room to whom this kind of cooperation is anathema than there are who are willing to give it a fair trial. I was rereading, in this connection, something that Carlos Romulo said in a speech that he made, in this very building, when he was Foreign Minister of the Philippines:

> "The world has changed, but we have not changed enough. Human perspective is still transfixed on the pressures but inadequate loyalties of home and country when it needs, at a time when men aim for the stars, to encompass at least the human family on this tiny planet circling a minor sun."

I think that, although human nature is against us, it does not mean that we should be deterred by our task; we should reserve International Space Year for tackling this problem, which has probably been judiciously put on one side for too long. That is why, at the end of it all, I have become a quite unashamed convert for the ISY.

Mr. RAO: The remarkable developments in the application of space technology to solving major world problems stand out as the most significant achievement of this century. Space platforms are now extensively used for achieving global communication, even in remote areas, for eradicating illiteracy, for world-wide weather monitoring, for monitoring the environment, and for the optimal management of natural resources in order to provide for people's minimal needs and for establishing human connectivity on a global basis. While space has already initiated a transformation of human society as a whole, many of the developing societies have yet to take advantage of the space revolution.

The greatest problem the world faces today is that of chronic hunger. Developing countries - which occupy less than 55 per cent of the geographical area of the world but carry over 75 per cent of the world's population and suffer from serious shortages of resources and capital, lack of trained manpower, large-scale illiteracy, low agricultural productivity, poor communications infrastructures, industrial backwardness and exponentially increasing populations - are facing very grim futures, which can be averted only by the applications of space technology. Recurring floods, droughts and earthquakes, combined with mismanagement of basic land and water resources and with increasing desertification and deforestation, have further impacted on the very survival of the developing societies.

A perusal of even the elementary facts can dramatically reveal the magnitude of the problems being faced by developing countries. While the availability of land for agricultural production is only about 0.17 hectares per capita in the developing countries, as against 0.6 to 0.8 hectares in the developed nations, agricultural productivity in the poorer nations ranges

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between 0.5 and 2.5 tons per hectare, as against the world average of 2.6 tons per hectare, and over 5 tons per hectare in the advanced nations.

Large-scale soil erosion due to deforestation, the non-optimal agricultural practices that are followed and increasing desertification have resulted in the reduction of 25 per cent of the arable land in every continent to the status of problem land, with another 25 per cent having very low productivity. While world-wide afforestation efforts are hardly making a dent - making up only about 10 per cent of the annual loss - desertification, particularly in Africa and Asia, is increasing at the alarming rate of over 0.5 million hectares per year. The scarcity of clean water, increasing pollution of marine ecosystems, serious environmental degradation and totally unsatisfactory communications have further aggravated the situation, to the detriment of the quality of life in these countries.

(Mr. Rao)

The utilization of space technology for achieving sustainable integrated development is now emerging as a very powerful tool for the rapid transformation of static societies. Combining the information derived from space on soil characteristics, forestry, agriculture, surface water, underground water potential, agro-climatic status, wasteland culturability and meteorology with socio-economic factors, it is now possible to come up with appropriate developmental strategies and to implement them at micro level for achieving integrated sustainable development. Appropriate expansion of communication infrastructure, along with space-based disaster warning systems, can rapidly establish human connectivity. Utilization of space technology for the large-scale improvement of rural education - particularly women's education and continuing education - forms an essential ingredient of the holistic approach to tackling the fundamental problem of inequity.

Space has unambiguously demonstrated the need for global cooperation in evolving collective strategies and for the recognition of mutual interdependence, which alone can ensure the continued habitability of the planet for future generations. It is only through international cooperation that mankind will be able to tackle the major problems of global warming and environmental pollution facing the world today.

Let me recall that if an intelligent being from another planet had visited this planet about a million or so years ago, it would have come to the conclusion that the most powerful and persistent species was the dinosaur. The dinosaur has become extinct. Today it is not only the biotic species - the very existence of mankind is in jeopardy if we do not collectively ensure that the integrity of the planet's environment is safeguarded.

(Mr. Rao)

The fundamental necessity of forging international cooperation in space is enshrined in the outer space Treaty, the Magna Carta of space, which proclaims that outer space is the common heritage of mankind and that it should be used exclusively for the benefit of all nations. The international treaties evolved under the aegis of the United Nations during the past three decades contain many unique and path-finding principles for promoting international cooperation in space for the common welfare and peaceful development of all nations. In the past, international cooperation in the field of space has taken shape through various bilateral and multilateral cooperative arrangements between various countries and through the establishment of various international and intergovernmental organizations. This cooperation has extended to provision of launch services, sharing of space segment capacities, provision of ground equipment, conduct of joint missions, access to data, mutual support for tracking services, participation in experiments conducted in space, and provision of opportunities for training. Based on the review and experience of such cooperative endeavours, the international community has come to the conclusion that such cooperation should not only be continued but also be substantially strengthened if we are to spread the unlimited benefits of outer space to all countries, particularly developing countries, for seeking solutions to their urgent problems. That was the important message of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE 82) and the United Nations Conference on Environment and Development.

The celebration of the International Space Year (ISY) in 1992, with its main emphasis on the theme "Mission to Planet Earth", truly signifies that common interest of the international community in coming together and

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exploring more ways to carry out international cooperation. The enthusiastic response of the international space community to ISY and the formation of the Space Agency Forum for International Space Year, a voluntary association of various space agencies for coordinating cooperative activities, amply testify to the importance the space community attaches to international cooperation in space. Several coordinated activities undertaken by various national and international forums such as the European Association for the International Space Year (EURISY), the International Astronautical Federation (IAF) and the Committee on Space Research (COSPAR) in connection with ISY are the best example of how international cooperation can be enhanced and encouraged in a short time given the will to act together. ISY is only a beginning; it is an effort firmly to establish a new spirit of cooperation. It is not just 1992: it must begin with 1992 and continue. The momentum generated by the activities during ISY has to be continued and enhanced by actively involving all countries, in particular developing countries, in order to ensure that all nations benefit from activities in outer space.

In the context of the vastly improved geopolitical situation in the world and a better understanding of the global changes that can affect the entire biotic species on this planet, the time is ripe to explore new approaches to international cooperation. I shall now make some pertinent suggestions for promoting international participation in space activities with greater involvement by developing countries to enable the whole of mankind to benefit from space.

First, the establishment of well-defined large-scale collaborative programmes among major national and regional space agencies has become imperative in the face of growing financial constraints. If the sharing of

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space resources can be accomplished, duplication could be avoided, to the benefit of all countries. This is particularly relevant in the case of remote-sensing satellites and environment-monitoring satellites.

Second, one of the important constraints that stands in the way of greater participation by the developing countries is the paucity of both technical and financial resources. Greater international assistance has to be organized to tackle this problem on an urgent footing, to enable the developing countries to initiate concrete application projects. Developing countries should also be encouraged to seek experiences and share them with other developing countries with a view to finding common solutions to their generic problems. This will call for encouraging developing countries to establish their own regional and multilateral programmes and establish regional centres to utilize their meagre resources optimally and in the most cost-effective manner.

Third, we should further strengthen the technical training programme to enable the planners, decision makers and scientists of developing countries to adopt space methods for solving their national problems. This will call for judicious funding and the holding of such training programmes in different parts of the world, through increased support from advanced countries having well established space programmes.

Fourth, we should stress the need for improved communication and utilization of space technology for the spread of relevant education in the developing countries, where over 30 per cent of the people still remain illiterate. While means of rapid communciation are crucial for dealing with emergency and disaster, education is fundamental to any development. For example, proper understanding of the importance of immunization could save

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over 10 million children - a large percentage of them from developing countries - who now die every year. Likewise, farmers in most of the developing countries, who hold on average between 0.24 and 1 hectare of land owing to extensive fragmentation, will not be able to risk implementation of innovative practices in agriculture unless they are fully convinced of the benefits. It is only through the rapid spread of education, backed up by resources, that increased food productivity, optimal management of land and water resources and adequate health care can be achieved.

Fifth, we must provide all possible assistance to developing countries in evolving and implementing integrated sustainable development strategies at micro level, which must necessarily be site- and culture-specific. The Indian experience shows the great relevance of satellite data to achieving integrated solutions for solving resource problems at the local level - which, while seeking to improve productivity, ensure that such development is in harmony with the environment.

Sixth, we should recognize the need to ensure the availability of remotely sensed data, which are now available from many satellites - such as IRS, LANDSAT, SPOT, MOS and ERS - for all countries in real time. Judicious establishment of receiving stations to fill existing gaps is crucial for ensuring the widespread use of space data. Equally important is to ensure that space data is made available to all countries at affordable prices and strongly to discourage the present trend towards increasing commercial exploitation of the data.

(Mr. Rao)

Seven, we should expand the cooperation initiated under ISY between various space agencies towards the systematic collection of data relevant to global-change studies and joint planning of future space activities for studying global problems of interest to all nations, such as climate, environment, productivity, desertification and disaster management. As effective use of data gathered from space depends upon the availability of adequate ground data across the globe, the participation of all countries in this effort has to be ensured. Ensuring that the developing countries play an active role in all the cooperative programmes and giving them access to the economic benefits of space activities is an important step, which needs to be consciously followed.

Eight, we should explicitly recognize that capabilities have to be developed within countries for appropriate applications, depending on their specific needs and priorities. International cooperation should take into account the strategies, needs and priorities chosen by each country, including the need for stimulation of the growth of indigenous nuclei to establish a self-sustaining technological base in space technology. In other words, it is important to realize that the international community should provide a fishing rod and not merely supply fish.

Nine, we should rapidly implement the UNISPACE 82 recommendations for facilitating the exchange of scientific and technological information and for the transfer of technologies to promote the use and development of space technology in developing countries. The recommendations also point out that no country should place undue restrictions and illogical embargoes on the sale of components, systems and sub-systems required for peaceful space programmes, and in this context call for evolving greater international understanding to overcome the difficulties faced by the developing countries. Embargoes and

(Mr. Rao)

the threat of sanctions have become a great hindrance for the developing nations, which are desperately trying to become self-reliant in developing their peaceful space programmes for the benefit of their peoples. The present international law relating to outer space should be elaborated to protect fully the interests of developing countries in their pursuit of peaceful space activities.

Ten, taking advantage of the recent geopolitical changes, we can now think of converting military space activities to civilian applications. The vast amount of resources spent on military activities could be profitably diverted not only for the deployment of spacecraft to monitor the implementation of international agreements and for peace-keeping efforts, but could also be used for funding space programmes exclusively meant to provide peaceful benefits to all nations.

In conclusion, international cooperation in the field of space needs to be responsive to the needs of all countries, particularly developing countries, if the real impact and benefits of such international cooperation is to be realized. We believe it is timely for the Committee on the Peaceful Uses of Outer Space to consider organizing a larger international gathering to discuss ways and means of promoting the widespread use of space technology for national development. We strongly urge the Committee to plan and organize UNISPACE 95, preferably in a developing country, to make sure that the spirit of ISY will continue to spread and transform all nations on this planet, to enable them equitably to share the benefits of space technology for their national development.

We are at a turning-point in the history of the world, as we approach the next century. If we do not cooperate internationally we shall be relegated to the dustbin of history. We have the opportunity to write history. We can

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write history if international cooperation and comradeship are established to achieve a better world for all humanity, to enable the unlimited benefits from space to be fully utilized to ensure that all human beings walk on this planet with their heads held high and with their minds free, a planet where universal literacy will spread its light and nobody will go to bed with an empty stomach, and where the purity of nature's environment will be guaranteed.

Mr. SAGDEEV: For us former Soviets it did not take much seven years ago to accept the idea of International Space Year. After all, in our old culture, bringing together important space events and different, mostly revolutionary, anniversaries, was very close to our hearts.

I met the late Senator Matsunaga on a number of occasions, and I understood that behind the idea of exposing space activities to the international community, of showing its prospects, he had an additional, and maybe even more important, agenda. It is no accident that his motto was "Let's have cooperation, not war, in space". Indeed, he was a good prophet. He did not live to see today, when we can celebrate the end of the cold war, with thousands of rockets originally built to destroy and kill now being dismantled, with a suggested programme of conversion to commercial or other civilian launchers.

The launchers now on the market - converted SS-18s, SS-19s and so on, and a similar number on the American side - are the cheapest-ever launchers and rockets. These are the rockets about which former Soviet Premier Nikita Krushchev spoke in the General Assembly Hall not far from here about 30 years ago, when he said that we Soviets were producing them almost as efficiently as hotdogs. Unfortunately, those 30 years have shown that it is much more difficult to produce hotdogs and sausages.

(Mr. Sagdeev)

The passage of 35 years since Sputnik I has brought extremely important anniversary for us Russians. It is especially important because it took precisely 35 years to realize that the nation needs a unified organization to run its space programme, not in the interests of the military, of the arms race, but in the interests of humankind, international cooperation, science and commerce. That is why we are now celebrating the recent creation of the Russian Space Agency, which replaces a number of other umbrella organizations, such as Glavcosmos - I am sorry, Dr. Rao -

Mr. RAO: It is your organization.

Mr. SAGDEEV: - Intercosmos, Intersputnik and of course, above all, the Ministry of General Machine Building; those present know what that is really about.

The Russian Space Agency, established only in February, has already taken some important steps, though it is far from bringing widescale international cooperation; in the area of cooperation we are just beginners. We followed Lenin's old dictum that before we could be united we had to be divorced. That is happening now in the former Soviet Union.

Nevertheless, one of the very first agreements between the Presidents of nine Commonwealth States was a treaty on space cooperation. This important framework now creates a chance that at least parts of the former Soviet space programme - I believe the most essential parts - will be rescued from disintegration and economic chaos.

Recent developments have indicated that this Commonwealth programme to bring together space assets is on the right track. On 26 May President Yeltsin and President Nazarbayev, of Kazakhstan, signed a treaty outlining the charter for joint uses of Baikonur. Some people know it under a different name: Tyratum. It is the biggest launching site in the former Soviet Union.

(Mr. Sagdeev)

Thus, the space programme is alive. Of the 800,000 employees of the former Ministry of General Machine Building, at least 60 per cent are still actively working and trying to integrate and launch missions. Some of these missions are international in nature: the deep-space exploration mission MARS 1994 and the robotic mission to be launched in 1994 and which is, I hope, still on schedule. There are a number of other international missions in space science. There are missions in applied technology and telecommunications that involve a number of foreign nations.

However, some of the assets of the former Soviet space programme are endangered and threatened with extinction. One of these is the well-known BURAN programme, the Soviet counterpart to the American shuttle. While I am not going to suffer from the eradication of this mission, it was not the best example set us by the Americans, and it was not wise of us to follow the American example. I think, however, that the loss of such an international space asset as the super-booster ENERGIA would be sorely felt by the entire international space community. There are a number of projects currently under discussion to make use of the super-booster launcher, which can deliver payloads of up to 100 tons into low Earth orbit. As to the notion of delivering a huge telecommunications platform - just imagine 20 tons in geostationary orbit! - it is not yet clear whether this particular use of ENERGIA would be the most effective one possible. Some skeptics claim that it would merely be an enormous orbiting bell jar. However, all the potentials of the super-booster must be discussed.

Other ideas involve the potential use of super-boosters in environmental research, not only for passive environmental monitoring but for future environmental engineering. Imagine a catalyser delivered in vast quantities

(Mr. Sagdeev)

to the outer layer of the atmosphere around the ozone layer which could save Planet Earth by restoring its protective ozone shield. However, the time for bold environmental engineering projects is still far ahead of us. We are only beginners, students studying the potential of these projects.

The rescue of Earth is a tremendous problem, but the problem that is being given the highest priority on the agenda of the Russian Space Agency is that of the rescue of former Soviet space assets. I firmly believe that these assets - at least the most peaceful of them, those that could be of use to humanity - cannot be saved without international efforts, without international treaties involving the participation of Soviet launchers, Soviet space brains, engineers, services and so on. There are already some signs that some preliminary contracts and agreements are being made in this area. They will not all lead immediately to spectacular environmental or telecommunications activities. Some are still in doubt - for example, the TOPAZ-TWO nuclear reactor, which is the younger sibling of the TOPAZ-ONE reactor so often discussed in this Committee in the past. TOPAZ-TWO has already been purchased by the Americans. There are other space-industry assets that have been purchased by international customers, for example plasma thrusters, which can in the foreseeable future deliver spacecraft into higher orbits at a far cheaper price. There is a chance that the vast experience accumulated by such areas of the Soviet space programme as the piloted MIR station will be used by other countries. The European space industry is already taking advantage of that experience, and the National Aeronautics and Space Administration of the United States (NASA) is considering using the experience gained by rescue modules like the SOYUZ-TM.

(Mr. Sagdeev)

Another sign of great progress is the fact that the United States Government has finally lifted its ban - on one occasion at least - on the launching of international payloads including American high technology from Soviet launching pads. I am referring to the permission to launch the INMARSAT satellite using the Soviet-Russian PROGNOS rocket should the INMARSAT international consortium so choose.

The conversion of the vast underground and underwater part of the iceberg in matters of space in Russia, the United States and other countries into peaceful uses is probably the greatest challenge facing us. There are already suggestions on the table to use the extra telecommunications capabilities and channels of some of the former military satellites or portions of their services. Environmental uses would provide an even greater challenge in the future. If Planet Earth is not yet recognized by all of us as the common heritage of mankind, at least the Committee on the Peaceful Uses of Outer Space recognizes that space is the common heritage of mankind, and that space must be used in the interests of saving our planet itself.

For after all, Earth is nothing but a lone spaceship travelling through the universe with all of us human beings as its crew. We have just saved this spaceship from the cold war and now it faces another challenge: global warming and the other environmental hazards facing it. The carrying capacity of this spaceship is limited. That is why environmental problems are becoming so very important. Some of the former military space assets could be converted and used for similar operations: the space technology and space resources of various countries could be used to support United Nations peace-keeping efforts; telecommunications could be used to support United Nations peace-keeping forces; reconnaissance data could be quickly captured

(Mr. Sagdeev)

from space satellites. If that potential of the space sector could be quickly realized we might be able to avoid through the use of early-warning satellites an embarrassing situation like the one that occurred a couple of years ago in the Persian Gulf.

As a matter of fact, taken step by step, the space assets of different nations - and of the United States and Russian first of all - are already being brought into service for joint peace-keeping.

(Mr. Sagdeev)

It is expected that the first bilateral agreement on an international early-warning center using data from the early-warning satellites of the United States and Russia will be signed tomorrow or the day after tomorrow in Washington during a summit meeting of Presidents Bush and Yeltsin.

I can appreciate the wisdom of American legislators who, seven years ago, originally contemplated the commemoration in 1992 of not only the 500th anniversary of Columbus' discovery of America or the 35th anniversary of Sputnik, but also the 75th anniversary of the Bolshevik revolution in Russia. But I would firmly reject the idea that celebration of the 75th anniversary of the Bolshevik Revolution was cancelled by the United States Senate Foreign Relations Committee: It was cancelled by President Yeltsin in his famous decree at the end of August last year in the aftermath of the failed coup d'état.

The CHAIRMAN: I thank Academician Sagdeev for those very interesting remarks; I am sure we got the message. Would any of the panelists like to comment on this afternoon's presentations?

Mr. BARNES: Obviously there was no advance coordination of our presentations, and we chose somewhat different paths, but I think we are all headed towards the same destination. It seems to me that there were a number of common themes, all of which are relevant to the activities of this Committee and the space agencies of the nations that are represented here.

Mr. GIBSON: I can only echo what Dick Barnes has said. I had been expecting a much greater diversity of views, but I think there is a considerable overlap. The thing that worries me is the next step, and I am dreadfully frightened that ISY is going to bring a kind of fervor that will not last very long. I think it essential that before the end of this year some

(Mr. Gibson)

modest steps be taken to make sure that it will continue. There are a number of ways in which it can, but in the past in international forums less distinguished than this one, we have never really been good at maintaining momentum. We have been very good at one-off activities, but what we are looking at now is the need for something rather less spectacular and more onward-going, a little bit duller than most activities, and it is very difficult to see how the initiative for that is going to come. I am not saying that it will not - I hope to God it will - but it will not be easy; it will not come on its own.

Mr. RAO: As Roy Gibson remarked, we have to ensure that ISY is not just for show and does not come to an end in 1992. It is as if IGY had started a new type of activity; ISY is to be considered as a spirit, as a beginning. One must take concrete steps to ensure that international cooperation becomes a reality. Unless such steps, however modest, are taken, this will be simply another marking of the event, but it will not start a new revolution. We need to ensure that the fullest benefit of space technology is taken advantage of by all countries, which means we must get together and evolve concrete programmes in which developing as well as developed countries can participate meaningfully.

The CHAIRMAN: This has been a most interesting discussion. The panelists deserve our thanks and those of the Committee for the thought-provoking ideas they have put before us this afternoon for the Committee's further consideration. Therefore, personally and on behalf of the Committee, I should like to thank all of the panelists for participating in this special commemoration of International Space Year and in particular for a

(The Chairman)

most informative session indeed. As the Under-Secretary-General stated, I hope delegations will find some of the ideas and suggestions worthy of further development and will in due course translate them into papers for the Committee's consideration.

The meeting rose at 5.05 p.m.